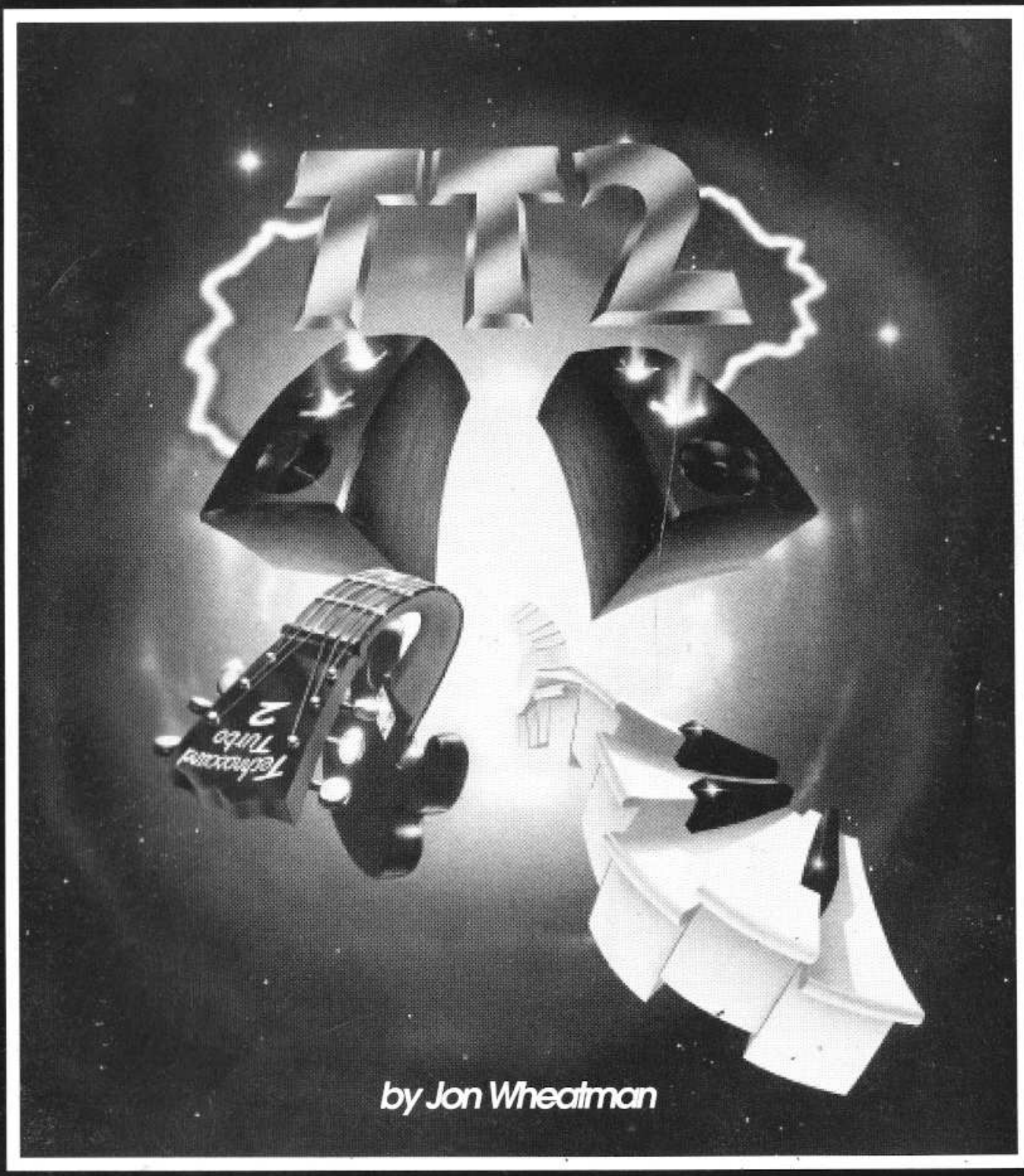
Technosound Turbo 2



Instruction Manual

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INTRODUCTION

Congratulations on purchasing the Technosound Turbo II sound sampling system.

The software has evolved from the innovative Technosound Turbo entry level sampler, and is packed with superb effects and features.The first sections of the user guide will give you an insight into the system's capabilities and allow you to try out some of the effects and routines. The other sections are for reference and describe each function in detail. Although we will be pleased to offer you assistance over the phone, experience has shown us that most problems can be overcome simply by reading the manual! However if you do have any difficulties, don't hesitate to phone - we want you to enjoy the product with the minimum of hassle!

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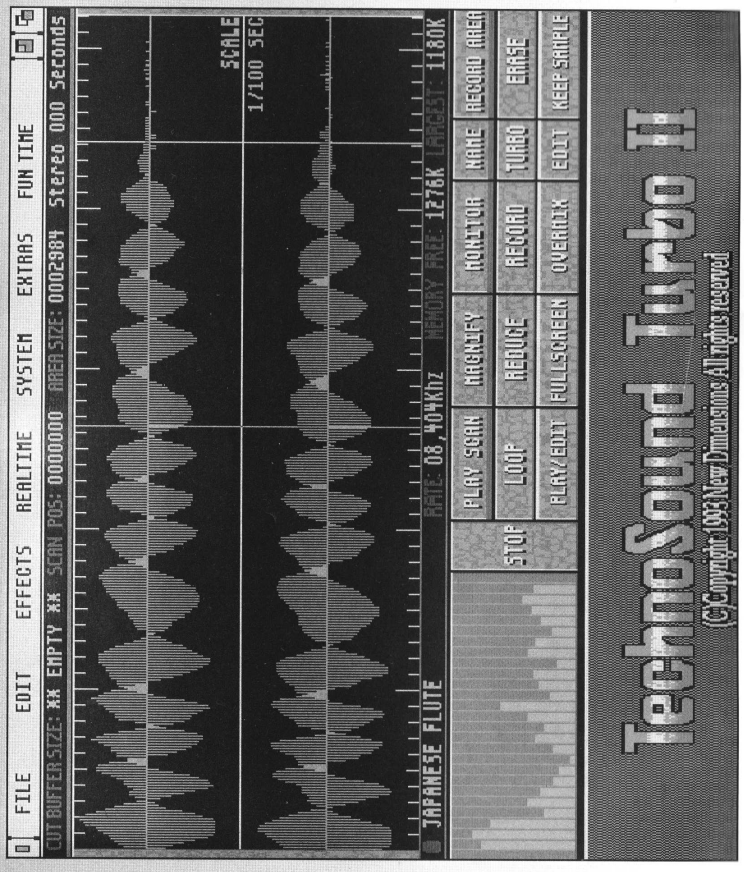


SECTION 1 : A QUICK INTRODUCTION

1. CONNECTING THE SAMPLING CARTRIDGE TO TO A SOUND SOURCE

The sampling cartridge is suitable for all Amiga models with the exception of the A1000 which requires a "gender changer" to make it fully compatible. This can be purchased from most dealers, and is inexpensive.

Make sure your computer is switched off! Then plug the cartridge into the printer port of your Amiga. Plug your audio lead into the two phono sockets at the back of the cartridge, and insert the 3.5mm stereo jack plug at the other end of the lead into the headphone socket of your sound source. This can be a CD player, Radio, Cassette recorder etc. If you want to use your stereo system as the source, you may need to use an adaptor if the jack plug is too small. Position the source away from computer, wherever possible to minimise the risk of interference.

A microphone can be used to great effect with the system, but first it must be connected via an amplifier or pre-amp, so that the input level can be controlled. Refer to the section on CONNECTION METHODS for further details.

2. STARTING THE TT2 SOFTWARE

IMPORTANT: *Before proceeding any further, please make a back-up copy of your TT2 program disk !*

Then insert the program disk into drive 0 and switch your computer on. After a few seconds the title screen will appear, then click on the mouse button. After a few more seconds the main TT2 screen will appear. Position the mouse pointer over the 'start' button in the centre of the screen and click on with the left button of the mouse. The credits will now disappear and the program will be ready for use.

3. SCREEN LAYOUT

The top half of the screen is the main display area where editing of the sample waveforms takes place. The area directly below and to the left shows the spectrum analysis of the input from your sound source. The buttons to the right of the analyser give instant access to various control functions, and can be activated by positioning the mouse pointer over the required selection, and clicking on the left hand mouse button.

Pull down menus can be selected by positioning the mouse pointer over any one of the seven main headings at the top of the screen and clicking on the right hand mouse button. Individual selection can then be made by positioning the mouse pointer over the function required and releasing the right mouse button. You will also notice various indicators positioned around the main display area which provide useful technical information.

4. MONITORING A SOUND SOURCE

You will be keen to hear some music being played through your system, so switch on your sound source and click on the 'MONITOR' button. You should now hear music being played out through your speakers via your computer. Adjust the volume, at the source, to suit your requirements. If nothing is coming through or if it is only operating in mono, click off the `MONITOR' button (using the right hand mouse button) and then click on 'RECORD ALL'. Two stereo oscilloscopes will appear in the main display window, showing left and right input waveforms. If two waveforms are not visible then check your connections from the sound source.

There are a variety of ways to connect up the input, but the simplest method is to plug the audio lead into the headphone socket of a cassette recorder. This will at least establish whether the hardware is functioning correctly. Refer to chapter on `CONNECTION METHODS' for further assistance if necessary.

If the input waveforms are visible, but there is no evidence of sound, then the output connections to the speakers will need to be checked. Again, refer to the chapter on `CONNECTION METHODS' if you require any further assistance.

5. REALTIME EFFECTS

Having established that the system is set up correctly, you can now experiment with the REALTIME effects.

PHASER

Click on the REALTIME menu using the right hand mouse button. Hold the button down and scan `PHASER' which is the first option on the menu. Release the button to reveal the phaser control panel. Now select 'TEST' with the left hand mouse button to hear the default phaser effect. Phaser is a very spectacular effect produced by a change in phase shift. Switch off the effect by clicking on the right hand mouse button. Position the mouse pointer over the DEPTH slider bar and move it to the right, using the left hand button of the mouse. Do the same with the SPEED bar and then click on 'TEST' again. You will hear a marked increase in the depth of phase shift coupled with an increase in its frequency. As you are still in `SWEEP' mode you will also hear the effect rhythmically rising and falling.

Now click on the `DIR' button to put the phase shift into FWARD mode and press `TEST' again. Instead of the uniform rising and falling effect heard previously, you will now hear the phase shift continuously falling until it reaches its peak at the end of each cycle. Repeat the exercise again for BWARD mode and you will hear the phase shift continuously rising.

Spend a few minutes experimenting with the various controls and try out the PRESETS. You will find these are very useful when you want to save a particular combination. Numbers 1 to 3 have been preset already, but these can be redesignated if you so wish. Altogether there are 999 preset positions available for use on each effect, which can all be saved to disk.

SAVING A PRESET

Make sure that your TT2 program disk is still located in the disk drive and set up a new combination of phaser effects. Select preset position 4 and exit back to the main display by clicking on the `CANCEL' button. Now call up the REALTIME menu again and scan down to `SAVE PRESET'. Release the mouse button to save the new combination automatically to the program disk. If you have already copied the program to the hard drive then the save routine will automatically seek out that drive and save the presets to it.

ECHO

Call up the REALTIME menu and scan down to `ECHO'. Release the mouse button to reveal the multiple echo control panel. Click on `TEST' to hear the default echo effect. A complete range of echoes can be produced with this effect, and as with phaser you can switch the effect off with the right hand mouse button.

Experiment with the various settings of the depth and speed bars and try out the presets 1 to 3. Unlike phaser you will notice that there is no direction control on this effect, or on any other of the effects.

DELAY

Call up the `DELAY' option using the same technique as with the previous effects, and try out the various settings. The DELAY effect is produced by delaying the output between the two speakers. This time you can vary the effect by adjusting the length and volume bars.

SWEEP - RAMP - SYNTHESIS

Try out these three effects in turn and use the Depth and Speed bars to vary the outputs with each option.

The SWEEP effect is produced by sweeping backwards and forwards between the two speakers in cycles.

The RAMP effect is produced by ramping the volume up and down in cycles.

SYNTHESIS varies the pitch of the output automatically up and down in cycles, and is ideally suited for use with a microphone. Refer to the chapter on `Connection methods' if you require assistance in connecting a microphone.

PITCH UP - PITCH DOWN

Finally try out these last two effects, which again are ideally suited for use with a microphone. They are similar to the synthesis effect, but this time the pitch does not vary automatically. Instead the pitch is controlled manually by adjustment of the depth bar.

FUN TIME

By now you should be gaining in confidence and becoming aware of the potential you have at your fingertips. Call up the FUN TIME menu at the top right of the display for even more amazing real time effects.

This time a large selection board will be displayed on the screen. Make sure that your sound source is still playing and click on the LISTEN button. You will see the first option `F1 - ECHO' highlighted on the display, and hear its effect playing through the speakers. Now press function key F2 on your computer keyboard. This will bring into play the REVERB effect.

Try out the other function keys F3 to F9 and also the numeric keys 1-9 at the top of the keyboard. In general you can have a lot of fun with most sound sources, but F5-F9 and the numeric keys are most effective when used in conjunction with a microphone. Switch off the sound by clicking the right hand mouse button. Click on `CANCEL' to exit from the FUN TIME menu.

6. RECORDING A SAMPLE

We hope you have had some fun with the realtime effects, which as you are no doubt aware, can be played continuously to liven up or enhance your sound source. Now we can move on to the more fundamental operation of sampling or recording.

RECORD

First make sure that sound is coming from your source by clicking on RECORD. You will hear the sound and also see the waveforms displayed in the oscilloscopes. If a sample has already been stored in memory you will first see a message appear asking you if it is ok to erase it. In this instance press the OK button. However, later on when you are familiar with the system, you may want to add the existing sample to the Edit List.

Click on the RECORD button in the display window when you are ready. The screen will go blank for a few seconds and then return to show the waveforms of the new sample. This sample is now stored in memory where it can now be edited, enhanced and mixed with other samples before being saved to disk.

The length of sample time is determined by the amount of memory in your computer and the sample rate. In this case the sample rate will be set at start up to approximately 14 Khz, which is a reasonable level for most applications. The amount of time available is shown in the top right hand corner of the display. You can stop the recording at any time simply by clicking the right hand mouse button.

RECORD + VOX

Call up RECORD again and clear the existing sample from memory. Pause the sound source, then click on RECORD + VOX. You will observe that nothing is happening and the oscilloscopes are showing a straight line in each channel. If the normal record button had been pressed, as in the previous test, you would now be recording silence!

The RECORD + VOX function is signal activated and thus will only allow recording to take place when it detects a meaningful signal. Press the pause button on your sound source and you will see the recording proceed as normal.

PLAY SCAN

This time we will play the sample back by clicking on the PLAY SCAN button on the menu. You will hear the sample being replayed and see the scan bar moving across the screen from the left. The scan bar indicates which part of the sample is being played. The exact position is shown in bytes at the top of the display window.

Click on PLAY SCAN again, but this time stop the playback half way across the waveform using the right hand mouse button. The exact position in bytes where the sample was halted will remain displayed at the top of the screen.

RECORD AREA

In order to use this function you will need to call up the left and right pointers. Position the mouse pointer anywhere in the left half of the display window and click on the left hand mouse button. The left hand pointer will now appear and can be positioned by releasing the left hand mouse button. Use the same procedure to position the right hand pointer, but this time use the right hand mouse button to position it, and space the two pointers approximately three seconds apart using the scale markings as a guide.

Click on the RECORD AREA button shown on the menu, to monitor the sound, then press RECORD in the display window. When recording has been completed, play the sample back using PLAY SCAN. Unlike RECORD which allocates all available memory for use, RECORD AREA purely allows you to record in the memory space available between the two pointers.

HD RECORD

There is a third recording method which allows you to sample directly to a hard drive. Refer to the reference section if you wish to try it out.

SAVING A SAMPLE TO DISK

Remove your TT2 program disk and insert a blank formatted disk. Call up the FILE menu and scan down to SAVE AREA, then release the mouse button to access the file requester. Type in the filename "TRIAL1" and press RETURN. After a few seconds the original screen will return, indicating that the file has successfully been saved to disk.

DELETING A SAMPLE FROM MEMORY

Call up the EDIT menu and scan down to DELETE. Release the mouse button to delete the sample from between the pointers.

LOADING A SAMPLE FROM DISK

Call up the FILE menu and scan down to LOAD AREA. When the file requester appears, the file name "TRIAL1" will still be present from the sample previously saved, so just push RETURN. After a few seconds the original sample will reappear between the two pointers.

7. EDITING A SAMPLE

In the EDIT menu you will find a series of functions for editing the sample in memory. For example CUT can be used to remove sections and PASTE can be used to insert them in a different place.

Move each pointer closer together until the area between them is approximately two seconds, then select CUT from the EDIT menu. The waveform between the pointers will now disappear from the screen, you will find however, that it has not been lost, but has merely been transferred to a separate cut buffer.

A simple test will verify this for you. Press PLAY SCAN and observe the scan bar travelling from left to right. Notice that no sound is heard. Now call up the EXTRAS menu and click on PLAY BUFFER. The contents of the cut buffer (which is in fact the section that was cut from between the pointers) can now be heard.

Return to the EDIT menu and explore the other editing features using the reference section as a guide, but first read the following information relating to the EDIT LIST.

THE EDIT LIST

The TT2 program has been designed to allocate memory on an "as required" basis, rather than allocating all of the memory on boot up. This is very significant because it enables you to handle multiples of samples in memory, without constantly having to save and recall them from disk. These samples can be individually named and retained in memory on an EDIT LIST. They will be updated automatically whenever editing takes place. When you first encounter an edit list message, check out the relevant procedures in the reference section.

ADDING EFFECTS TO THE SAMPLE

Click on DELETE from the file menu to clear all current samples from memory, then press RECORD to produce a new sample. Call up V.DELAY from the EFFECTS menu, type in 300 at the millisec's prompt, and then press DELAY. A 300 millisecond delay will now automatically be applied to the current sample, and its effect can be judged by pressing PLAY SCAN. Delete the sample again and record a new one. This time try out V.ECHO. Repeat the procedure for the remaining features on the EFFECTS menu and assess each one in turn.Note that adding more than one effect to a sample will tend to diminish the quality rather than enhance it.

Well that concludes the basic course, so give yourself a pat on the back ! There are many more features to learn and enjoy, but you should have acquired sufficient knowledge and confidence to learn about these directly from the reference section.

SECTION II - GENERAL INSTRUCTIONS

1. INSTALLING ON A HARD DISK

To install TT2 on your hard disk, start your Amiga from the hard disk and click on SHELL. Now type in the following commands line by line, being careful not to introduce errors:

```
COPY DF0:TECHNO#? DH0:
COPY DF0:LIBS/arp.library LIBS:
```

That's all there is to it. If your hard disk has a name other then DH0: you'll need to type that instead.

2. SETTING THE SAMPLING RATE

The sampling rate can be easily modified by using the PREFERENCES function in the FILE menu. Move the slider bar to the right for a higher sampling rate. The sampling rate can be seen in the centre of the screen below the preferences box. The colour of the number is usually yellow, if however, the colour is blue, then that indicates that the sampling rate will only work correctly on machines with a 68020 processor or higher. The maximum sampling rate in mono or stereo is 50,669hz.

The higher the sampling rate, the higher the quality, as more memory is used.Note that the sampling frequency is stated per channel, therefore 37,000Hz in stereo is effectively twice 37,000 bytes per second.

Hint: *If you already have a sound in the memory, increasing the sampling rate simply plays it faster. In other words, it's not possible to improve the quality in retrospect. It's a good idea to start sampling at a somewhat higher rate as long as your available memory allows this.*

3. THE EDIT LIST

The task of loading in samples from disk can be very laborious, and it is for this reason that TT2 has been designed with a special, quick-action, sample handling capability. Once loaded, the samples can be retained in memory by adding them to an EDIT LIST, from which they can be accessed almost instantaneously. The group of samples contained in the list is referred to as the Set.

The list can be displayed by clicking on the EDIT button, which is located on the main menu, below the display window. Samples can be added to the list individually, using the NAME and KEEP SAMPLE functions, or they can be added as a Set, directly from disk using the LOAD SET routine, which is located on the FILE menu.

Similarly the samples can be saved to disk individually, using SAVE AREA(the sample must be displayed on screen) or they can be saved in Sets, to a single file, using SAVE SET. This is particularly useful as all samples stored in memory will be lost when the program is terminated, or when there is a power failure. A Set file can be of great benefit when handling samples in other situations, for example, when using the Tracker program.

When a sample in the Edit List is being edited on the screen, it automatically updates the list at the same time. Thus, it is not necessary to have to save it to the list again, once the editing has been completed.However, care must be taken if a sample is deleted accidentally from the Edit List, whilst still remaining displayed on the screen. It will be treated as if it was a new sample, and must therefore be named, and restored again into the Edit List, if it is required for further use.

Warning messages appear whenever a current sample is in danger of being lost. They provide an opportunity to add the sample to the Edit List, and appear throughout the TT2 program.

4. TECHNOSOUND SUPPORT FILES

The following files can only be run from the CLI (Shell):

PlaySample {samplename}

This program will play the specified IFF sound sample. The routine will automatically detect whether the sample is stereo or mono, and will also play it at its proper sampled frequency.

HDPlaySample {samplename}

This routine will play the sample specified, which has been saved using the hard disk record utility on the TT2 software. The sample can be of any length with no memory restrictions, other than 64K free bytes required for use within the routine itself. Use of the right mouse button will exit the routine.

HDPlaySampleNOQUIT {samplename}

This is exactly the same as HDPlaySample above, but the right mouse button will not exit, this means that the sample will continue to play until it has finished. Although the samples are recorded in mono, the above routines use the pseudo stereo effect for playback. The two HDPlaySample commands do not require much system time, therefore they can be run on a separate shell process at the same time as other processes, for multi-tasking purposes. If any of the functions fail to execute, they either can't find the file specified, or there is insufficient memory for the task.

5. CONNECTION METHODS

There are a variety of ways of connecting both the input and the output, but here are the most common configurations:

a) INPUTS

i. Preferred method - connect the jack plug into a headphone socket, thus enabling the volume to be adjusted

ii. Line out from the back of a CD Player, Tape or Amplifier. Not recommended, as the output volume cannot usually be controlled and could result in samples being too loud or too quiet.

iii. In order to connect a microphone to the system you must first amplify the signal. You can achieve this with a microphone mixer or pre-amplifier. A cassette recorder can also be used, providing that it has the facility to send the microphone signal through its headphone socket. Similarly, you can connect a guitar or other instrument to the system as long as it is pre-amplified.

iv. A keyboard can be connected providing it has a headphone socket or line output. If you have a midi keyboard and interface, then this can also be used in conjunction with the MIDI MODULE facility contained within TT2.

b) OUTPUTS

i. Television and computer monitors can be used for sound output although the quality will not match that of a hi-fi system.

ii. Using standard audio hi-fi leads, you can connect the audio output from your Amiga to almost any hi-fi system or amplifier. Refer to the manufacturers guide for connection details, but note that the Amiga should be treated as if you were simply adding an extra CD player.

6. THE POINTERS

The pointers can be used for sectioning off areas of sample waveform for editing purposes. The left pointer can be positioned by moving the mouse arrow into the display area and clicking on the left hand mouse button. The right pointer can be positioned in a similar fashion by clicking on the right hand mouse button. Fine adjustment can be achieved using the cursor keys, which move the pointers in increments of 8 bytes. The left pointer is controlled by the left and right cursors and the right pointer is controlled by the up and down cursors. This feature is particularly useful when used in conjunction with the ZOOM facility.

SECTION III - REFERENCE SECTION

1. THE MAIN MENU

PLAY SCAN

Plays the current sample between the pointers. The scan bar identifies the current position of the sound being played. Play can be halted at any time by clicking on the right hand pointer of the mouse. The scan bar will disappear, however, its position in memory can be read in bytes at the top of the screen.

LOOP

Loops can be created by positioning the two pointers any distance apart on the current sample, and clicking on LOOP with the left hand mouse button. Clicking the right hand mouse button will stop the loop. Use in conjuction with PLAY/EDIT and ZOOM to achieve very tight loops, which can then be saved to disk.

PLAY/EDIT

Plays the current sample between the pointers, but unlike PLAYSCAN the pointers can be adjusted during play, to edit the sample. Play is continuously looped between the two pointers and can only be halted by pressing the STOP button. The scan bar is not visible with this option. Use in conjunction with LOOP and ZOOM to create very accurate loops.

MAGNIFY

Enlarges the waveform between the pointers to the full width of the screen. This process can be repeated up to 99 times, and a maximum close-up of 640 bytes of the sample, full screen, can be attained. The pointers must be re-positioned after each magnification, across the relevant section, before proceeding to the next level.

REDUCE

Reverses the enlargements, step by step, back to the original level of magnification.

FULLSCREEN
Restores the pointers back to their original positions, at the start and end of the sample currently being displayed.

MONITOR
Enables the sound from the source to be heard and monitored in realtime. The sound can be switched on or off by toggling the menu button.

RECORD
Samples the current sound source, and allocates all available memory for recording purposes. The source is displayed for monitoring purposes on two oscilloscopes which appear when the menu button is activated. Recording can be started manually by clicking on the RECORD button in the window, or it can be triggered automatically by clicking on the RECORD+VOX button. The automatic function waits until a signal is detected before starting the recording process, and can therefore eliminate the silence at the start of a track. If sampling is halted with the right mouse button then the memory not used will be release to the system.

OVERMIX
Enables a new sample to be superimposed over an existing sample in real time. The pointers must first be positioned around the sample on the screen, and the MONITOR button switched on to hear the new sound. This sound can then be recorded over the sample by first clicking off MONITOR,and then clicking on OVERMIX. After the recording has been completed, the results can be played back, using PLAYSCAN. This technique can be used, for example, to overlay vocals on a backing track.

NAME
Normally used in conjunction with KEEP SAMPLE, this function facilitates the naming of samples in memory, prior to inclusion in the Edit List. It can also be used to re-name existing samples in the Edit List, for example, those listed as unknown samples.

TURBO
This function resets the system to operate in the standard Technosound Turbo mode, and as a result, all of the available memory is automatically displayed on the screen. In practical terms this means that if say a 500k sample was loaded in to a computer with 2mb of available memory, then the waveform will initially take up the first 25% of screen area on the left hand side, leaving the remainder of the screen blank. If further samples need to be added, then the left hand pointer must first be positioned on the right hand edge of the previous sample, to avoid overwriting it. Samples can be edited and saved to disk in the normal TT2 manner.

EDIT
The EDIT button gives access to the Edit List selector, where samples are retained in memory for editing purposes. The samples can be selected by pointing the mouse arrow at the appropriate name, and clicking on the left hand button of the mouse. A choice can then be made between deletion of the sample from memory - by clicking on the DELETE button, or displaying the sample on the screen - by clicking on the EDIT button in the window.

N.B. *The samples retained in the Edit List will be lost once the program has been terminated, or if power failure occurs ! However they can be saved to disk using the SAVE SET command which can be found on the FILE menu.*

RECORD AREA
This function is identical to RECORD, except that the sampling is restricted to the area between the two pointers. As memory is only allocated when a sample is displayed, this option can only be used if a sample, or its allocated memory space, is present on the screen (existing samples can be removed from the screen to leave their allocated space, by using the DELETE command on the EDIT menu). Alternatively, switching to TURBO mode will display all available memory for use. The amount of recording time available is shown in seconds at the top of the display window, and can be adjusted to suit by varying the distance between the two pointers.

ERASE
Removes the sample currently displayed on screen, unless it is stored within the Edit List, in which case you must remove it using the EDIT button.

KEEP SAMPLE
Adds samples from the screen into the Edit List. A selector appears when the button is clicked on, enabling the storing of the whole waveform, or just the area displayed between the two pointers. Use in conjunction with the NAME option, otherwise the sample will be stored in the Edit List as an unknown sample.

2. THE FILE MENU

The following LOAD and SAVE routines use individual file requesters which can be operated in the following manner. Position the mouse arrow over the name of the file for selection, and click on the left hand button of the mouse. Alternatively, type in the name of the file at the prompt. Click on the OK button to initiate the function.

LOAD WAVE
Loads complete IFF samples from disk into memory, and displays the waveform on the screen.

Note: *If the sample exceeds the amount of available memory, then an error message will be displayed, and you will need to use the LOAD AREA option in conjuction with TURBO mode. This will enable you to load in as much of the sample as possible, providing the pointers are positioned to as far apart as possible, i.e. at the start and end of memory.*

LOAD AREA
Similar to LOAD WAVE, but the sample length is restricted to the amount of memory available in the space between the two pointers. Memory must first be allocated, either by engaging TURBO mode, or by deleting an existing sample from memory, using the DELETE command on the EDIT menu.

LOAD SET
Loads Sets of samples from disk, directly into the Edit List. The individual samples can then be displayed on the screen, by pressing the EDIT button on the main menu, and selecting the sample for editing.

SAVE AREA
Saves the sample area between the two pointers, direct to disk, in IFF format.

Note: *Remember to remove the TT2 disk first, and replace it with a blank formatted disk !*

SAVE SET
Saves all the samples in the Edit List to disk, under one separate filename.

DELETE
Enables selected sample files to be deleted from disk.

Note: *Care must be taken to avoid deleting files from the TT2 program disk !*

RAMSCAN
Displays the whole of the computer's chip memory, allowing access to any programs previously situated in memory. Any samples contained within these programs will be highlighted by their waveform characteristics, and can therefore be retrieved, providing that the relevant copyright laws are observed.

Note: *Most of the RECORD and EDITING commands are not available for use in the RAMSCAN mode.*

PREFERENCES
The VOLUME, SAMPLE RATE and VOX (Recording) levels can be reset by adjustment of the slider bars. The new levels can then be activated by clicking on the OK button, and will remain active until the program is terminated. The original default settings will then return when the TT2 program is next booted up.

ABOUT
Displays information about author and software revision.

QUIT
Exits the program.

Note: *All samples stored in memory will be erased !*

3. THE EDIT MENU

CUT
Cuts out the area between the pointers and copies it to the cut buffer, leaving a gap in the original waveform.

COPY
Copies the area between the pointers into the cut buffer, leaving the original sample intact.

SPLICE
Cuts the area between the two pointers into the cut buffer. It then moves the remaining part of the sample across from the right, to close the gap. Useful for swapping samples around in memory.

PASTE
Takes the contents of the cut buffer and pastes it into the sample memory, using the left pointer as the starting position. Any data already in the memory will be overwritten, but the buffer will remain intact. If the area between the pointers is smaller than the contents of the cut buffer, the full contents of the buffer will not be copied.

INSERT
Takes the contents of the cut buffer and inserts it into the sample memory using the left pointer as the starting position. Any data already occupying this position will be moved across to the right, and any data at the end of the memory will be lost. The full contents of the buffer will be transferred across unless it exceeds the area between the two pointers. In which case data from the buffer will only be copied across as far as the right hand pointer.

MIX
Takes the contents of the cut buffer and mixes it with the data already in sample memory. Great effects can be achieved with a little experimentation. Copy a sample into the cut buffer (try a vocal) move the left pointer a little to the right, and hit mix, move it further to the right and hit mix again. Make sure the right pointer is sufficiently far right so that it does not truncate the mix.

DELETE
Clears all data between the two pointers leaving memory allocation intact, and free to use.

N.B. *Use with caution !*

CHOP
Deletes the area outside the pointers, and moves the area between, to the start of the main sample.

FLIP
Reverses the sample between the two pointers, giving a backward appearance to the waveform.

CLR BUFFER
Clears the cut buffer and de-allocates the memory.

ADD WSPACE
Adds an additional 10k of memory to the end of the current sample for editing purposes.

4. THE EFFECTS MENU

V.DELAY - (Variable Delay)
A delay can be introduced by typing in a number in the range 1-9999 milliseconds. Click on the DELAY button to activate the effect, then press PLAY SCAN to hear the results.

V.ECHO - (Variable Echo)
The Echo effect can be controlled by typing in a Delay in the range of 1-9999 milliseconds, and by an adjustment of the Percentage Decay slider bar. Click on the ECHO button to activate the effect, then press PLAY SCAN to hear the results.

V.SYNTHESIS - (Variable Synthesis)

This function allows a microphone to be connected, and effects to be added, in real time. However, unlike the equivalent function on the REAL TIME menu, recordings can be made directly into sample memory. The pitch, which rises and falls automatically, can be set by adjustment of the DEPTH and SPEED bars, whilst the results of the various settings can be heard by pressing the TEST button. Finally, the recording can be activated by clicking on the RECORD button in the window.

MAXIMISE

Amplifies the area between the pointers to the maximum amplitude available, before distortion occurs.

LOW PASS

Passes the sample between the pointers through a low pass filter. This filters out the higher frequencies whilst allowing the lower ones to pass through. Noise generally tends to reside in the higher frequencies, so use this facility to improve noisy samples or to soften the sound.

AMPLIFY

Amplifies the sample between the pointers. This is very useful for samples recorded at low volumes, or which have been extensively edited. Select the amount to be amplified by adjusting the slider bar accordingly.

SOFTEN

Reduces the volume of the samples between the pointers. Avoid too much softening as this may result in an increase in noise. Select the amount to soften by adjusting the slider bar accordingly.

FADE IN

Creates a fade in effect on the sample between the pointers. The wider apart the pointers, the longer the fade in. The sample size is also drastically reduced in the display area.

FADE OUT

Creates a fade out effect on the sample between the pointers. The comments applying to fade in also apply here.

COMPRESS

Reduces the sample between the pointers to half of its original size. The software removes every other byte in order to save memory space. When you replay the compressed sample, you must reduce the sample rate to half of its original recording rate.

5. THE REALTIME MENU

The following effects can all be controlled by the use of slider bars and the results heard by clicking on the TEST button shown in the appropriate window. The positions of the slider bars can all be stored as presets and saved to disk. The first three preset positions have already been designated but these can be modified, if required.

PHASER

A spectacular effect produced by a change in phase shift. The Depth and Speed can be adjusted with the slider bars, whilst the direction can be changed at the press of a button between Forward, Backward and Sweep modes.

ECHO

Multiple echoes can be produced by varying the Depth and the Speed.

DELAY

The output between the two speakers can be delayed to produce this effect. Variations can be achieved by adjusting the Length and Volume of the delay.

SWEEP

Sweeps backwards and forwards between the two speakers. Variations can be achieved by adjusting the Length and Speed of the sweep.

RAMP

The volume is ramped up and down with this effect, and the Depth and Speed can be adjusted to produce variations.

SYNTHESIS
Specially designed for use with a microphone. The pitch rises and falls in a cycle, which can be adjusted by varying the Depth and Speed.

PITCH UP
The pitch is increased manually by adjusting the Depth. For use with a microphone.

PITCH DOWN
The pitch is decreased by adjusting the Depth. Also for use with a microphone.

SAVE PRESETS
Saves all the current preset positions to the TT2 program disk. Select a preset number in the range of 1 to 999 within any of the REALTIME effects as described above. Reposition the slider bars to a new setting and then select SAVE PRESETS. The new positions will be saved to disk and will be re-called whenever TT2 is loaded in the future.

6. SYSTEM MENU

MODE
Switches the mode of the system between Mono and true Stereo.

AUDIO FILTER
Switches the low pass audio filter within the Amiga, ON or OFF(The Default setting is OFF). The Amiga POWER light will be bright if the audio filter is switched ON. Frequencies above 7 Khz are filtered out. This is very effective for improving samples recorded at frequencies below 14 Khz.

HD RECORD
This innovative facility allows samples to be recorded directly to a hard drive in realtime, thus overcoming the restriction of storing in memory. The operating parameters will vary considerably from machine to machine, with the sampling quality being affected by several different factors, notably processor speed, disk access time and the particular version of Kickstart being used. For example, an A600 with a standard hard drive could possibly run faster than an A3000 with a slow hard drive (although it is unlikely !) but in general terms, the faster the hard drive, the better the results.

A standard A500 running Kickstart 1.3, linked to an A590 hard drive, could be expected to sustain a maximum sample rate of approximately 12Khz. Although an A1200 with a standard IDE hard drive could sample up to 40Khz with few problems, the benefits would be slight, as the maximum playback speed is restricted to 28Khz.

To initiate recording, select the desired sample rate from the PREFERENCES menu, and then click on HD RECORD. Type in a new file name and press OK, when you are ready to start. Click on the right hand mouse button to stop the recording. Note: Samples are recorded in mono only.

HD PLAYBACK
Replays samples that have been recorded straight to hard drive, either in mono, or in simulated stereo (PSEUDO PLAY). To initiate playback, select the file from the requester by pointing and double clicking on the mouse, then choose between MONO or PSEUDO PLAY.

SEQUENCER
Enables samples to be linked together to create sequences. Refer to appendix B for full instructions.

HD LOAD
Enables direct to disk samples to be loaded (and hence edited) into memory. A byte offset can be typed in once the sample has been selected,enabling the sample to be loaded into memory from that point. If the number entered in is 0 bytes, then as much as the sample as possible will be loaded in, starting from the beginning.

HD SAVE
Enables direct to disk files currently loaded into memory to be saved back to hard disk after editing. This enables the complete file including the original non-edited part, to be retained.

Note: *Never use SAVE AREA in this instance, as the non-edited portion will be lost.*

CHIP/FAST
Provides a choice of memory for different applications. Select CHIP before loading samples into memory, if they are to be used with the TRACKER program, as this program can only replay samples stored in CHIP memory. Select the ALL option for all other purposes, to ensure all memory is available for use.

MIDI MODULE
Enables samples to be played from an external midi keyboard. Full instructions can be found in appendix C.

7. THE EXTRAS MENU

SEEK ZERO
The pointers are moved towards each other until they reach a point where the waveform has a zero amplitude. Having both pointers at zero prevents harsh transitions when creating loops.

SEEK LOOP
Similar to SEEK ZERO, except that maximum values are sought, not zeros. This is another method for preventing harsh transitions when creating loops.

PHASE SHIFT
Varies the phase shift of the sample to reproduce the spectacular phaser effect, as heard on the REALTIME menu.

INVERT
The waveform is effectively rotated through 180 degrees so that the positive parts of the waveform become negative and vice versa.

PLAY BUFFER
Plays the contents of the cut buffer. Used during editing.

TRACKER
Song composition facility. Full instruction can be found in appendix A.

ZOOM
Provides a very close-up view of each pointer and the sample waveform, thus enabling extremely accurate adjustments during loop creation and sample editing.

SHOW POS
Indicates the two pointer positions numerically in the middle of the display window. Used in conjunction with the scale display for accurate sample looping and editing.

8. THE FUNTIME MENU

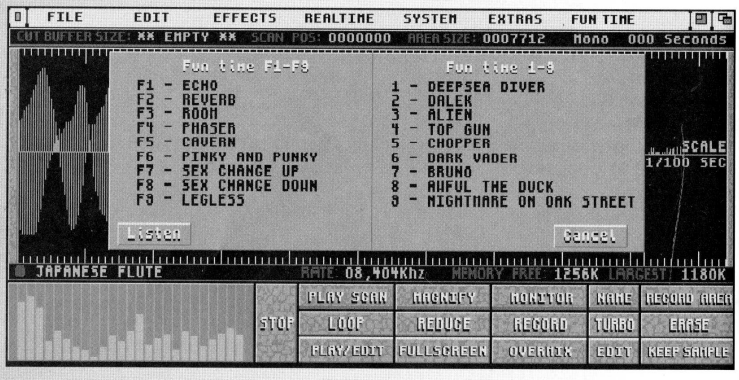
The FUNTIME MENU consists of 18 realtime novelty effects, mainly for use with a microphone. The selection screen is displayed by clicking on FUNTIME, and the individual effects are selected by pressing the function keys F1-F9, or the numeric keys 1-9, at the top of the keyboard.

Most of the effects speak for themselves ! But some will require a little bit of experimentation and a lot of imagination to get the most out of them. For example, you will need to blow into the microphone to simulate a jet fighter with the TOP GUN effect, or to simulate a helicopter with the CHOPPER effect.

Playing vocals through the SEX CHANGE UP/DOWN options can prove very interesting. For example Madonna might be mistaken for George Michael ! or Boy George could be taken for Nora Batty (only kidding George) !

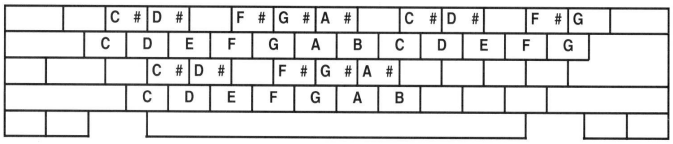
Don't be surprised if Lennox wants a word with you when you use the BRUNO effect, if you know what I mean Harry ! You'd better keep ducking and diving! Talking of ducks, whatever happened to AWFUL THE DUCK? Perhaps that nasty DARK VADER has "Forced" the stuffing out of him !

The funtime effects have all been pre-set and cannot be adjusted. However they have all been created from the REALTIME menu, so it is possible to create your own versions and save them as presets. You can also add most of the funtime effects to your samples, using the EFFECTS menu. In particular the VOICE SYNTHESIS option is very effective, producing a wide range of sounds.



Fun Time Menu

KEYBOARD DESIGNATIONS FOR USE WITH TRACKER



APPENDIX A - THE TRACKER PROGRAM

Enables samples of individual instruments to be inserted into the four audio channels of the Amiga, to be arranged in patterns to form musical compositions. It is a creative tool, and as such, an understanding of melody creation would be useful. However the basic concepts are simple to grasp, and the novice will quickly be able to produce something that sounds quite presentable.

USING THE TRACKER - A SIMPLE GUIDE

STAGE 1 - LOAD IN A SAMPLE

First select the CHIP/FAST option from the SYSTEM menu and set the memory to CHIP.

Note: *The samples used within the tracker program must always be stored in CHIP memory.*

The tracker program will only accept samples from the EDIT LIST, so for the purposes of this exercise we will use two of the samples supplied with TT2 - Bassdrum and Hihat. Add these to the current EDIT LIST and click on the TRACKER program from the EXTRAS menu. It would be useful at this stage if any other samples on the Edit List were deleted, to avoid any confusion.

THE TRACKER DISPLAY

Don't be overawed by the tracker display, when it appears, as most of the numbers shown in the window are there purely for reference purposes. The four Amiga audio channels are shown at the top of the screen, and a pattern designator is shown below. Musical notes can be typed in from the keyboard (see opposite) into any one of the positions shown, from 00 to 31, listed down the left hand edge of the designator. Further numbers will appear, once the pattern is in progress, representing the sample number (2 digits) and the effects number (5 digits), but don't be concerned about these for the time being.

STAGE 2 - CREATING A PATTERN

The program allocates a separate number for each sample in the edit list. The first sample in the edit list is 00, the second sample is 01, and so on.The first sample on your edit list will be Bassdrum (assuming that the edit list was empty to start with) and its name will appear in the display at the bottom of the window.

You can now create a pattern with this sample, but first you must position the white selector bar, using the cursor arrows, at 01 near the top of the pattern designator. Then use the left and right cursor arrows to highlight channel 1. Now press the letter P on the keyboard to insert note E3 at the start of the pattern. Move the selector bar down to position 4 and type in P again. Repeat this for every fourth position down to 28 and finally click on PATTERN to hear the result. Press STOP to halt play.

Now call up the Hihat sample by positioning the mouse arrow over SMPLE 00 shown in the top right hand corner (point at the number only) and click on the left hand mouse button to increase the number to 01. (Clicking the right hand mouse button decreases the number).

Highlight channel 2 with the cursor arrows. Move the selector bar to position 00 and press the key to the left of the BACKSPACE key to produce the musical note G3#. Repeat this for every even number down to the end of the pattern. Finally press PATTERN again to hear the result.

Well it's not exactly chart material ! But you must be getting the idea by now.

CREATING A MELODY

A pattern is restricted to the 32 positions shown, and must therefore be linked to other patterns in order to create a melody.

Each pattern created is automatically allocated the number shown in the top right hand corner of the window PAT'N 00 to PAT'N 99. When a new pattern is required, you must increase the current number by one, using the mouse arrow,a message will ask you if you want to create a new pattern. If the answer is YES then the pattern currently being displayed will be cleared ready for a new one.

When you have decided that you have enough patterns for your song you can program the melody arrangement using S-POS (song position) and S-LEN (song length).

Increase the S-LEN number to correspond to the total number of patterns (repeated or otherwise) to be played in the melody. Then arrange the patterns in the required sequence, by first selecting a pattern number to correspond to S-POS 00. Then proceed to S-POS 01 and select the next pattern number. Repeat this up to the number specified in S-LEN and then select a TEMPO number. Finally click on PLAYSONG to hear the results, the tempo or the arrangement can then be re-adjusted and played back until you achieve the desired result.

THE TRACK EDITING FACILITIES

COPY

Copies the pattern currently displayed on the screen to a separate buffer.

DELETE

Three options are available:

(a) SONG - Deletes everything from memory except for the contents of the TRACKER buffer, the main EDIT cut buffer, and any sample waveform currently in the display window.

NOTE: *the EDIT LIST is also deleted.*

(b) PATTERN - Deletes the pattern currently being displayed.

(c) CHANNEL - Deletes the channel currently highlighted.

PASTE

Two options are available:

(a) PATTERN - Pastes the pattern in the TRACKER buffer into the pattern on the screen to form a new pattern.

(b) CHANNEL - Pastes the channel in the TRACKER buffer into the corresponding channel, currently highlighted on the screen.

EFFECT

Controls the performance characteristics of the tracker samples by the use of slider bars, and provides the following options:

(a) VOLUME/PITCH - Can be used in two separate modes. The first mode (which is the default mode) becomes active when the selection at the top of the box is set to "NO ASR (SETVOL)". The slider can then be used as a volume control.The second mode becomes active when the selection at the top of the box is set to "PITCH UP & ASR" or "PITCH DWN & ASR". The slider can then be used to bend the pitch of the sample.

(b) ATTACK - Effectively fades in the sample. When the slider is moved further to the right, then the fade in is slowed down.

(c) SUSTAIN - Controls the length of time that the maximum volume of the sample can be sustained. When the slider is moved further to the right, then the length of time is increased.

(d) RELEASE - Effectively fades out the sample. When the slider is moved further to the right, then the fade out is slowed down.

MODE SELECTION

The selector at the top of the EFFECTS box allows a choice of four separate modes:

(i) NO ASR (SETVOL)

Where the attack, sustain and release effects are switched off, and only the volume can be controlled. (This is the default condition)

(ii) PITCH UP & ASR

Allows the pitch to be bent upwards using the VOLUME/PITCH control. The other effects also become active.

(iii) PITCH DWN & ASR - As above, except that the pitch can be bent downwards.

(iv) ASR IN USE ONLY - Standard ASR mode, with the VOLUME/PITCH switched off.

APPENDIX B - THE SEQUENCER

The sequencer provides a simple but very effective method of linking samples together in a sequence. The program can deal with very long sample files without having to display the waveforms on the screen.

If you don't have a hard drive connected to the system then you will need to create a RAM DISK. Refer to your Amiga Workbench manual if you are unsure how to do this. The samples you wish to sequence must be placed into the RAM DISK, to do this load them from disk and save them back to the RAM DISK.

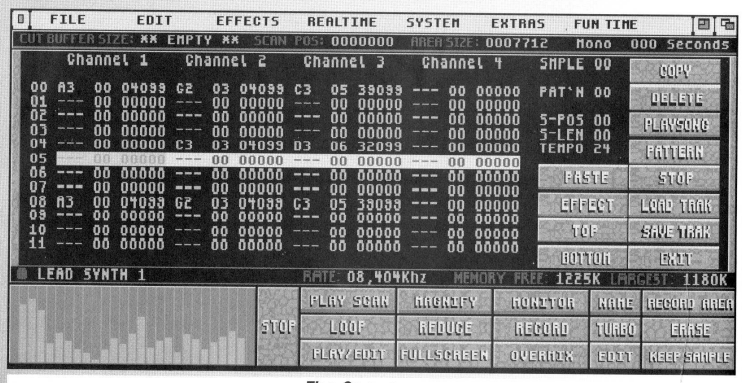
Click on the SEQUENCER icon from the SYSTEM menu and call up the file requester by pressing ADD (ensure first that the highlighted bar is at the top of its window). Select a file with the mouse arrow from the hard drive or ram disk, and then press the OK button, to add the file to the sequence list. Repeat this procedure for all of the other samples you wish to add, remembering that they will be replayed in the same order. When you have added the required number of samples, examine the list on the screen. You will see a start and end number for each sample, both of which can be adjusted. This is a numeric form of editing that enables you to section off parts of the original sample. Adjustment is made by pointing the mouse pointer over the appropriate number, and clicking on the left hand mouse button to increment the number, or the right hand button to decrement it.

A clock in the top right hand corner of the window records the number of seconds from the start of the sequence, after play commences. Play can be stopped at any time by clicking on the right hand mouse button, whereupon the clock will also stop. This can be very useful, if for example, you want to start the sequence ten seconds from the original start, you can program this in as an offset, in the box in the top left hand corner of the window (click either arrow to adjust the number).

Files can be erased from the sequence list by moving the highlight bar over the appropriate name and pressing ERASE.

Sequencer files can be saved to disk by clicking on save and typing a new file name in the normal manner. Similarly sequencer files can be loaded in using the LOAD button.

NOTE: *A sequencer file does not contain the actual samples that are to be sequenced, only the file names are stored. So you must ensure that you do not delete the samples from disk, as the sequence will not function correctly.*



The Sequencer

APPENDIX C - THE MIDI MODULE

The MIDI MODULE enables samples from the Edit List to be played on all four audio channels of the Amiga from a midi keyboard, drum box or external sequencer (via a midi interface).

Connect the keyboard into the system and load the samples into the Edit List,then click on MIDI MODULE from the SYSTEM menu, to initiate the program. The screen will go blank, and the system will wait for a midi signal to be detected. If the keyboard produces a note on midi channel 1, then the first sample on the Edit List will be played at the appropriate pitch. If the note is produced on midi channel 2 or 3, then the second and third samples respectively will be played. However notes for the fourth audio channel, are controlled using midi channel 16. The individual note produced from the keyboard will play a specific sample from the Edit List. For example, lower C will play sample 4 on the Edit List, lower C# will play sample 5 etc.

As the MIDI MODULE is a real time function, it can be used in a similar manner to a conventional sound module, with the exception that only four channels are available for use.

APPENDIX D - USING THE CARTRIDGE WITH OTHER PROGRAMS

SAMPLING PACKAGES

The Technosound cartridge can be used with a variety of other well known commercial and public domain sampling packages. Most packages have a facility for using different types of sampler, in most cases select the "GENERIC" type of sampler for maximum quality. Refer to the manufacturer's manual for more information.

SPECTRUM EMULATORS

Most public domain Spectrum emulators have a facility for loading games from cassette. The Technosound cartridge is fully compatible with these types of emulator, so don't throw away all those old games you've got in the attic.

YOUR OWN PROGRAMS

You can use the cartridge for you own programs in assembly language or C, or even a high level language like Database Software's excellent AMOS package. This can open up a world of possibilities for programs like simple speech recognition. Follow the steps listed here:

STEP 1 - INITIALISE THE PARALLEL PORT FOR INPUT

Clear the byte at address $bfe301 to set the port to input mode. Write the byte 6 to address $bfd200 to initialise the left and right channels. Write the byte 2 to address $bfd000 to select the left hand channel for input.

Assembler code:

```
                        ; Registers: DDRB (Parport data) CIA A
move.b #0,$bfe301       ; set port to input
                        ; (SEL/POUT) DDRA CIA B
move.b #6,$bfd200       ; initialise left & right channels
                        ; (SEL/POUT)=1 PRA CIA B
move.b #2,$bfd000       ; select the left channel
```

STEP 2 - READ THE DATA

The sampled data can be read as a byte from address $bfe101, and must then be converted to a signed integer. This can easily be done by subtracting 128 from the sample. The sample will then be in the range of 0 to 127 for a positive voltage, and 0 to -128 for a negative voltage. Therefore when there is no sound going into the cartridge, the sample value should be around zero.

Assembler code:

```
move.b $bfe101,d0     ; get the sample from parallel port
subi.b #128,d0        ; sign the data
```

The data can now be stored in a buffer and the next sample taken. If you wish to sample the right hand channel then simply send a 4 byte to $bfd000instead.

APPENDIX E - THE SAMPLE SET

FORMAT

The Edit List can be saved to disk using the SAVE SET function. This combines all of the samples in the Edit List into one whole file. The format of this file is as follows:

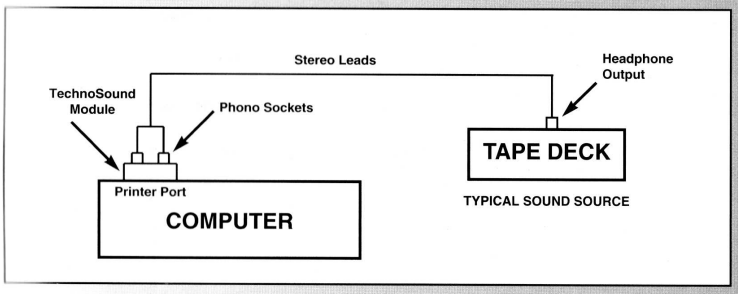
LONGWORD	'BANK'	4 character ascii set header
LONGWORD	0000	null padder
LONGWORD	'SMPL'	sample chunk header
LONGWORD	nnnn	sample size
28 bytes		sample name, null terminated

Next is the sample data. Samples are stored one after another, and can be detected by the SMPL header, size and filename, following at the end of the last samples data. The last sample in the list is indicated by the end of the file being reached.

APPENDIX F - TECHNICAL DATA

S/N ratio:	30.48 dBs
Maximum frequency:	98.5kHz
Frequency selection:	software driven
Resolution:	8 bits
Tolerance:	+/- 0.5 LSB
Maximum input signal:	2.5 V RMS
Noise filtering	
Multiplexed stereo input	

TECHNOSOUND TURBO 2 CONNECTIONS (See page 15)



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